In the Claims:

1. (currently amended) An apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string, said apparatus including:

a cylinder including a chamber which has a bore, an inlet gallery and an exhaust gallery[[,]];

a work piston ~~adapted to have~~ having reciprocal movement in the bore of the chamber and having a radial wall ~~which will seal~~ for sealing against the wall of the bore of the chamber during [[its]] the reciprocal movement within the chamber[[,]];

the work piston having a first land at one end of the work piston and a second land at the second end of the work piston[[,]];

[[means]] an apparatus to alternately duct fluid under pressure from the inlet gallery into the bore of the cylinder above the first land of the work piston and be exhausted from the bore of the cylinder below the second land of the piston into the exhaust gallery ~~to move the work piston within the bore~~, and to duct fluid under pressure from the inlet gallery into the bore of the cylinder below the second land of the work piston and be exhausted from the bore above the first land of the piston into the exhaust gallery to reciprocate the piston within the bore[[,]];

a piston shaft connected to the work piston ~~and adapted to transmit~~ for transmitting the forces generated by the reciprocatory motion of the piston to ~~a mandrel~~ the drill string; and

a relief bore communicating with the bore of the chamber and having a first end open to the bore of the chamber above the first land of the work piston and a second end

open to the bore of the chamber below the second land of the work piston;

the relief bore including a reciprocatable relief piston, wherein the movement of said reciprocatable relief piston is determined by the movement of fluid into and out of the relief bore from the bore of the chamber.

2. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim 1, wherein each inlet gallery of the piston has an inlet port to enable pressurised fluid to enter the gallery, said inlet gallery communicating with the bore of the cylinder through a port which terminates at the surface of the wall of the bore.

3. (canceled)

4. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim [[3]] 1, further including:

a relief bore ~~located in~~ having a first end communicating with the bore of the chamber above the first land of the piston and a second end communicating with the bore of the chamber below the second land of the piston[[,]];

a relief piston located in the relief bore ~~and adapted to have~~ having reciprocal movement within the bore and able to seal against the wall of the relief bore during [[its]] the reciprocal movement[[,]];

a first relief bypass ~~which communicates~~ for communicating with the ~~portion of the~~ first relief bore; and ~~of the cylinder at one end of the work piston and with the relief bore at one end of the relief piston,~~

a second relief bypass ~~which communicates~~ for communicating with the ~~portion~~

~~of the~~ second relief bore; ~~of the cylinder at the second end of the work piston and which communicates with the relief bore at the second end of the relief piston~~, wherein the construction and arrangement being that as the work piston moves in one direction within the bore of the ~~cylinder~~ chamber, fluid within the bore at a first end of the ~~cylinder~~ chamber will be forced through the first relief bypass into the first end of the relief bore to move the relief piston within the relief bore to pressurize fluid within the second end of the relief bore and to move fluid through the second relief bypass into the second end of the bore of the cylinder.

5. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim 1, wherein each inlet gallery extends 360° around the wall of the chamber.

6. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim 1, wherein the body of the work piston includes a first transfer gallery extending longitudinally through the body and communicating through the radial wall of the work piston with said inlet gallery for a predetermined time during the reciprocatory movement of the work piston and also communicating with the bore of the cylinder through the first radial face of the work piston.

7. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim 1, wherein the body of the work piston includes a second transfer gallery extending longitudinally through the body and communicating through the radial wall of the work piston with said inlet gallery for a

predetermined time during the reciprocatory movement of the work piston and also communicating with the bore of the cylinder through the second radial face of the work piston.

8. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim 1, wherein the chamber includes two exhaust galleries, the first exhaust gallery communicating with the cylinder chamber above the first radial face of the work piston and the second exhaust gallery communicating with the bore of the cylinder below the second radial face of the work piston, the first and second exhaust galleries including outlet ports to enable fluid within the galleries to be ducted away from the bore of the cylinder.

9. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim 1, wherein the location of the opening of the first transfer gallery in the radial wall of the work piston is offset longitudinally to the opening of the second transfer gallery in the radial wall of the work piston.

10. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim 1, wherein the cylinder is supported by a rig and the work piston includes a piston shaft which is connectable to the ~~mandrel~~ drill string.

11. (currently amended) The apparatus ~~Apparatus~~ for generating sinusoidal pressure waves for application to a ~~mandrel~~ drill string as claimed in claim 1, wherein the cylinder chamber forms part of a drill head which includes a ballast weight.